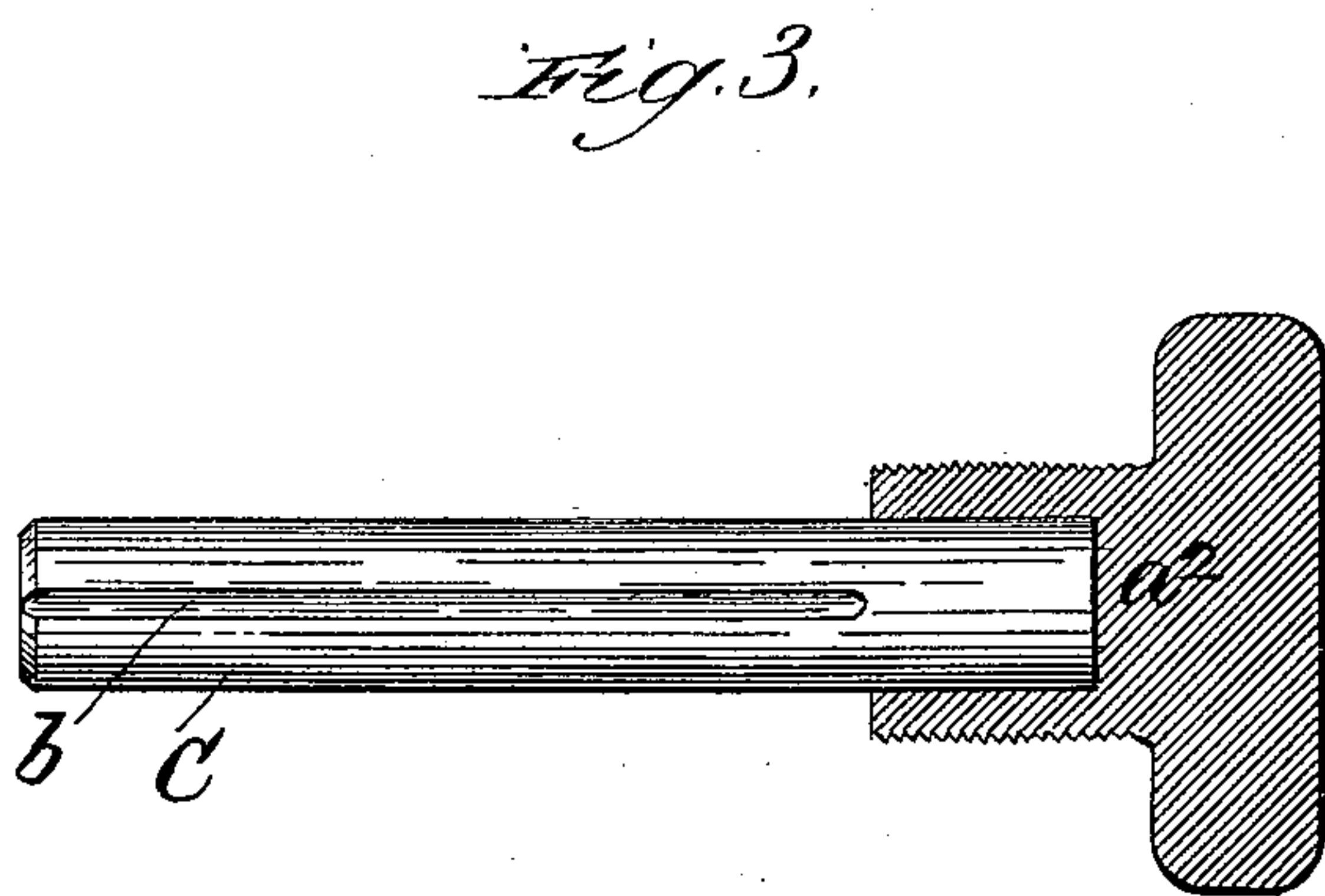
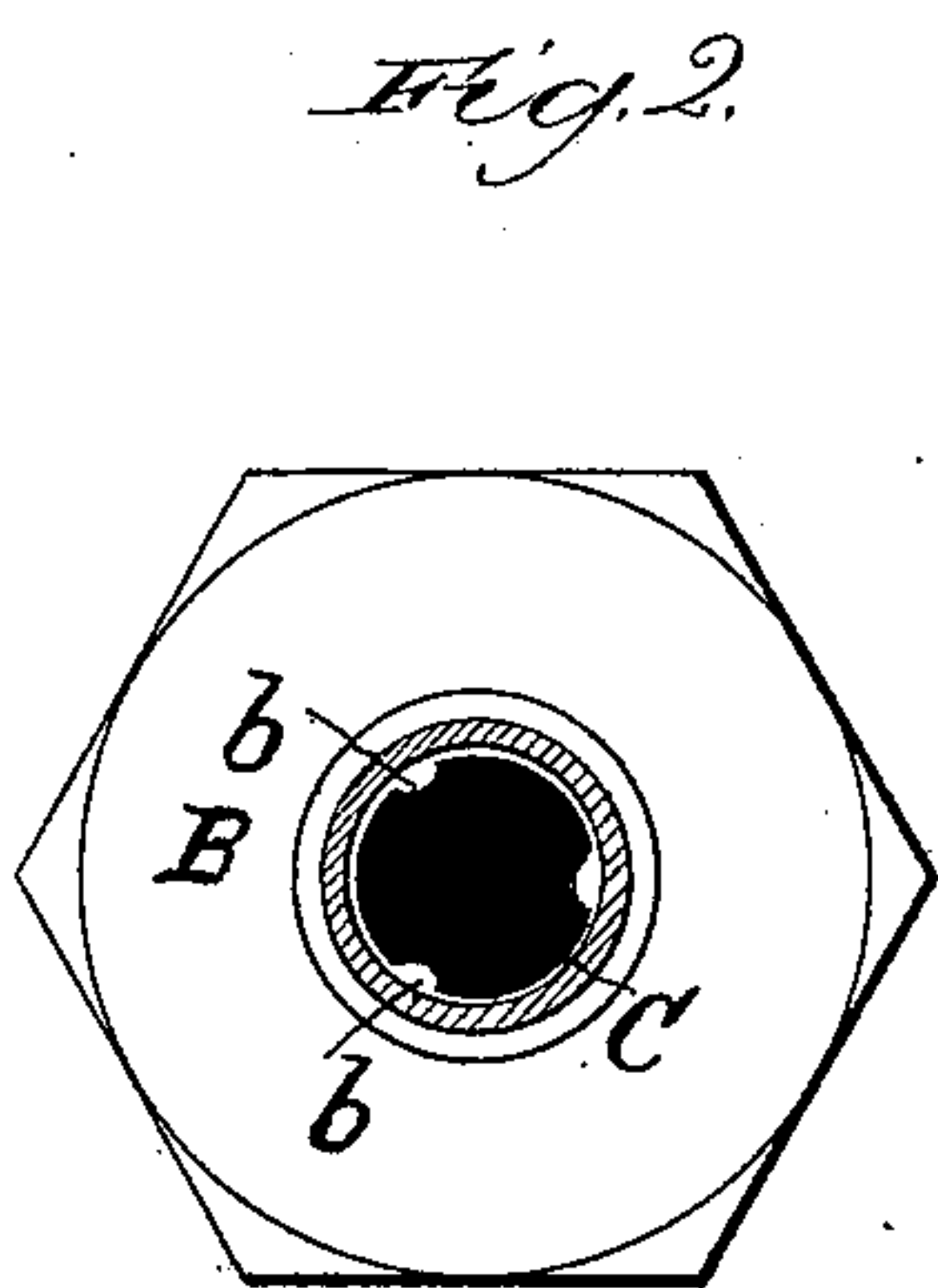
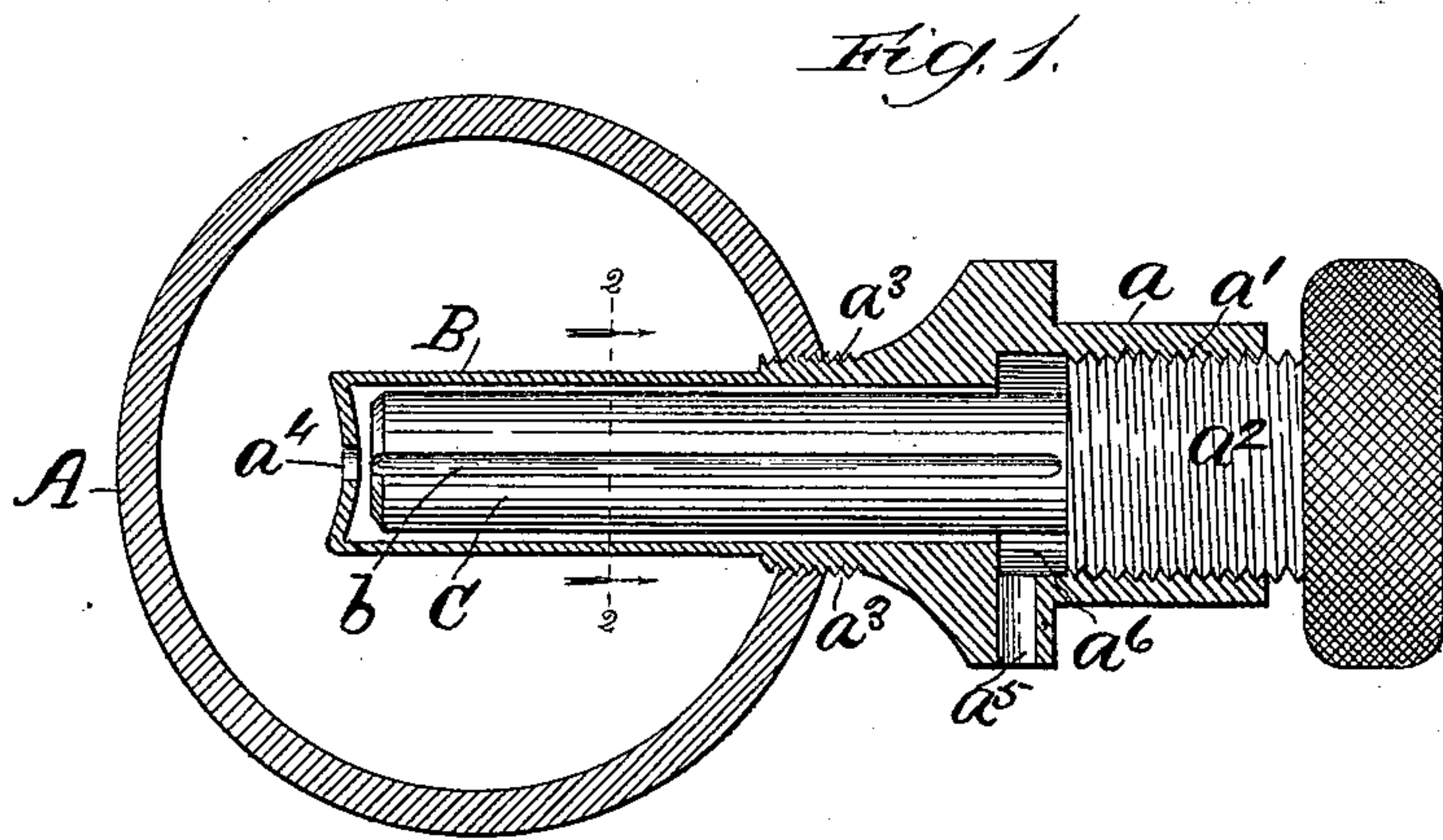


(No Model.)

G. M. DAVIS.
AIR VALVE.

No. 404,963.

Patented June 11, 1889.



Witnesses:
E. S. Gaylord,
L. M. Freeman.

Inventor:
Geo. M. Davis.
By L. B. Coupland & Co.
Attys.

UNITED STATES PATENT OFFICE.

GEORGE M. DAVIS, OF CHICAGO, ILLINOIS.

AIR-VALVE.

SPECIFICATION forming part of Letters Patent No. 404,963, dated June 11, 1889.

Application filed March 8, 1889. Serial No. 302,439. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. DAVIS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in an Air-Valve, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates more especially to the class of air-valves used on radiators in the system of steam-heating for the purpose of allowing the air to escape and to trap the steam. The valve may be set to act automatically or be adjusted by hand and worked on the expansion principle.

Figure 1 is a longitudinal section showing the device inserted in a radiator pipe or tube; Fig. 2, a transverse section in plane 2, Fig. 1; and Fig. 3 a side elevation of the expansion-stem, the screw-threaded adjusting-head being shown in section.

Referring to the drawings, A may represent a steam-radiator; B, the expansion-valve tube, and C the expansion-stem inserted in the expansion-tube. The valve-tube is composed of metal and is provided with the enlarged mouth-end a , having the screw-threaded interior a' for the reception of the correspondingly-threaded head a^2 of the expansion-stem.

The tube B is provided exteriorly with the threaded part a^3 and screws into the radiator at that point, the expanding part proper of the tube extending into the radiator, as shown. The expansion end of the valve-tube is provided with the small aperture a^4 , through which the air, expelled from the radiator, passes into said tube and finally escapes into the outer atmosphere through the vent-opening a^5 , leading out from the chamber a^6 .

The expansion-stem will be composed ordinarily of vulcanite or of some suitable composition, of which rubber is the principle ingredient. This stem is provided longitudinally with a number of grooves b , to facilitate the escape of the air forced out by the pressure of steam, as the stem will usually be made

close-fitting in the tube, leaving but a small annular space between the two, so that the greatest expansion of the stem will be end-wise. The inner end of the expansion-tube presents the convex seat to the seating end of the expansion-stem inclosing the aperture a^4 . By properly adjusting the expansion-stem with reference to the seating end of the tube the air-escape passage will be automatically opened and closed by contraction and expansion. The expansion-tube extending directly into the radiator receives the direct heat of the steam and has a more sensitive and positive action and thereby prevents any of the products of condensation from escaping through the air-valve. The arrangement is simple and convenient, and only as much of the surface of the expansion-stem is exposed to the direct contact of the steam as equals the area of the aperture in the end of the tube, thus greatly increasing the durability of these parts.

When the rubber stem has become worn, it can be easily replaced by another without the least inconvenience. The valve can be opened also and closed by hand when necessary.

The vulcanite expansion-stem and screw-head or nut may be formed integral, or the stem and head in distinct parts, as practical working may require.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a radiator, of the valve-tube projecting inside of the steam-space and provided in the inner end with an inlet-opening and exteriorly with an escape-opening, and the expansion-stem inserted in said tube and closing said inlet-opening by expansion after the cold air is expelled and uncovering the same when the steam is shut off, substantially as and for the purpose set forth.

2. In an air-valve, the combination, with the expansion-tube projecting inside of the radiator and having the outer enlarged mouth-end a threaded interiorly, and the exteriorly-threaded part a^3 , of the expansion-stem inserted in said tube and provided with the

threaded head a^2 engaging with the correspondingly-threaded mouth part, substantially as and for the purpose set forth.

5 3. In an air-valve, the combination, with the vented expansion-tube provided exteriorly with the threaded part a^3 , and having the expansion end extending inside of the steam-space, of a radiator, and the expansion-

tube provided longitudinally with a number of grooves and inserted in said tube, substantially as and for the purpose set forth. 10

GEORGE M. DAVIS.

Witnesses:

L. M. FREEMAN,
J. B. DONALSON.